IN THE CLAIMS

1. (currently amended) A digital subscriber line communicating system for communicating between a transmitting side and a receiving side through a communication line, comprising:

a sliding window generating unit for generating a sliding window based on a timing signal representing a periodical noise duration; and

a sliding window transmitting unit for transmitting discrete multitone (DMT) symbols according to said sliding window through said communication line to said receiving side;

said sliding window generating unit comprising:

a hyperframe counter for periodically counting a predetermined number of continuous transmitting DMT symbols constituting a hyperframe synchronized with said timing signal; and

a decoder for discriminating, based on the count value output from said hyperframe counter, whether a transmitting data symbol belongs to a far end cross-talk duration at said receiving side or a near end cross-talk duration at said receiving side.

2. (original) The digital subscriber line communicating system according to claim 1, wherein said hyperframe counter is reset each time when said hyperframe counter counts said predetermined number of continuous transmitting data symbols.

3. (previously presented) The digital subscriber line communicating system according to claim 1, wherein said transmitting side is a central office and said receiving side is a remote terminal;

said central office comprising:

a timing signal generating unit for generating said timing signal synchronized with a periodical noise including said periodical noise duration which interferes with said central office and said remote terminal;

a receiver equalizer; and

a sequencer for effecting a transition of the status of initialization of said central office during an initialization period before starting usual communication, said initialization period including an activation and acknowledgement sequence, a transceiver training sequence for performing an initial training of said receiver equalizer, a channel analysis sequence for measuring the quality of said communication line, and an exchange sequence for determining the transmitting capacity of said communication line based on the measured quality of said communication line.

4. (original) The digital subscriber line communicating system according to claim 3, wherein, said sequencer effects the transition of the status based on the value counted by said hyperframe counter.

5. (previously presented) The digital subscriber line communicating system according to claim 3, wherein, during said transceiver training sequence, said exchange sequence, and said channel analysis sequence, said initialization is carried out by transmitting DMT symbols through only the inside of said sliding window.

6. (previously presented) The digital subscriber line communicating system according to claim 3, wherein, during said transceiver training sequence, said exchange sequence, and said channel analysis sequence except for a quality measuring sequence, said initialization is carried out by transmitting DMT symbols through only the inside of said sliding window, and during said quality measuring sequence in said channel analysis sequence, said initialization is carried out by transmitting DMT symbols through both the inside and the outside of said sliding window.

7. (original) The digital subscriber line communicating system according to claim 3, further comprising:

a sequence transition determining unit for making a transition, in synchronization with said timing signal, from said activation and acknowledge sequence to said transceiver training sequence or from said transceiver training sequence to said channel analysis sequence.

8. (original) The digital subscriber line communicating system according to claim 1, wherein said transmitting side is a remote terminal and said receiving side is a central office;

said remote terminal comprising:

a timing signal generating unit for generating said timing signal synchronized with a periodical noise including said periodical noise duration which interferes with said remote terminal and said central office;

a receiver equalizer; and

a sequencer for effecting a transition of the status of initialization of said remote terminal during an initialization period before starting usual communication, said initialization period

including and activation and acknowledgement sequence, a transceiver training sequence for performing an initial training of said receiver equalizer, a channel analysis sequence for measuring the quality of said communication line, and an exchange sequence for determining the transmitting capacity of said communication line based on the measured quality of said communication line.

9. (original) The digital subscriber line communicating system according to claim 8, said sequencer effects the transition of the status based on the value counted by said hyperframe counter.

10. (previously presented) The digital subscriber line communicating system according to claim 8, wherein, according to a single bitmap mode, during said transceiver training sequence, said exchange sequence, and said channel analysis sequence, said initialization is carried out by transmitting DMT symbols through only the inside of said sliding window.

11. (previously presented) The digital subscriber line communicating system according to claim 8, wherein, according to a dual bitmap mode, during said transceiver training sequence, said exchange sequence, and said channel analysis sequence except for a quality measuring sequence, said initialization is carried out by transmitting DMT symbols through only the inside of sliding window, and during said quality measuring sequence in said channel analysis sequence, said initialization is carried out by transmitting DMT symbols through both the inside and the outside of sliding window.

12. (original) The digital subscriber line communicating system according to claim 8, further comprising:

a sequence transition determining unit for making a transition, in synchronization with said timing signal, from said activation and acknowledgement sequence to said transceiver training sequence or from said transceiver training sequence to said channel analysis sequence.

13. (previously presented) The digital subscriber line communicating system according to claims 3 or 8, wherein, according to a dual bitmap mode, said DMT symbols are transmitted from said transmitting side through both the inside and the outside of said sliding window, and said DMT symbols are used for training of said receiver equalizer by said receiving side only when said receiving side is in a far end cross-talk duration.

14. (original) The digital subscriber line communicating system according to claim 3 or 8, wherein, according to said dual bitmap mode, during the training of said receiver equalizer in said transceiver training sequence, a step size for updating coefficients of said receiver equalizer is made to be zero in said near end cross-talk duration, or to be a value smaller than the value in said far end cross-talk duration in said near end cross-talk duration at said receiving side, so that said transceiver training sequence is carried out continuously in said far end cross-talk duration and said near end cross-talk duration at said receiving side.

15. (previously presented) The digital subscriber line communicating system according to claim 3 or 8, wherein said receiving side comprises:

a synchronization symbol detecting unit for detecting a synchronization symbol included in each of superframes which constitute said hyperframe;

an inverse synchronization symbol detecting unit for detecting an inverse synchronization symbol included in said hyperframe; and

an inverting unit for rotating the phase of each carrier signal of the detected inverse synchronization symbol, except for the carrier signal of a pilot tone, by substantially 180° to obtain an inverted inverse synchronization symbol having the same phase as the phase of each of the detected synchronization symbols;

the detected synchronization symbols and the inverted inverse synchronization symbol being used for the training of said receiver equalizer.

16. (previously presented) The digital subscriber line communicating system according to claim 3 or 8, wherein for watching or re-synchronizing the superframe or the hyperframe synchronization, in the case where the synchronization symbol is detected at the receiving side, the synchronization is checked with detection of the next inverse synchronization symbol, and in the case where the inverse synchronization symbol is detected, on the other hand, the synchronization is checked with the next detected synchronization symbol.

17. (currently amended) A digital subscriber line communicating system for communicating between a transceiver in a central office and a transceiver in a remote terminal through a communication line, wherein, during timing recover training sequence between said central office and said remote terminal, an[[d]] inside discrete multitone (DMT) symbol of a downstream sliding window is formed by a first kind of signal, and an outside DMT symbol of

said downstream sliding window is formed by a second kind of signal, said first kind of signal and said second kind of signal being obtained by modulating a carrier signal but being different in phase by a predetermined angle, and

said transceiver in said remote terminal recognizes whether a received DMT symbol belongs to a far end cross-talk duration at said remote terminal or a near end cross-talk duration at said remote terminal, by detecting the phase of the output of a fast Fourier transform of said carrier signal, so as to recognize the phase of a timing signal which represents a periodical noise duration.

18. (currently amended) A digital subscriber line communicating system for communicating between a transceiver in a central office and a transceiver in a remote terminal through a communication line, wherein, during timing recover training sequence between said central office and said remote terminal, an inside discrete multitone (DMT) symbol of a downstream sliding window is formed by a first kind of signal, and an outside DMT symbol of said downstream sliding window is formed by a second kind of signal, said first kind of signal and said second kind of signal being obtained by modulating a carrier signal but being different in phase by a predetermined angle, and

said transceiver in said remote terminal recognizes whether a received DMT symbol belongs to a far end cross-talk duration at said remote terminal or a near end cross-talk duration at said remote terminal, by detecting the phase of the output of a quadrature phase shift keying demodulation of said carrier signal, so as to recognize the phase of a timing signal which represents a periodical noise duration.

19. (canceled)

20. (currently amended) A transceiver to be connected through a communication line, comprising:

a sliding window generating unit for generating a sliding window based on a timing signal representing a periodical noise duration; and

a sliding window transmitting unit for transmitting discrete multitone (DMT) symbols according to said sliding window through said communication line to said receiving side;

said sliding window generating unit comprising:

a hyperframe counter for periodically counting a predetermined number of continuous transmitting DMT symbols constituting a hyperframe synchronized with said timing signal; and

a decoder for discriminating, based on the count value output from said hyperframe counter, whether a transmitting data symbol belongs to a far end cross-talk duration at said receiving side or a near end cross-talk duration at said receiving side.

21. (original) The transceiver according to claim 20, wherein said hyperframe counter is reset each time when said hyperframe counter counts said predetermined number of continuous transmitting data symbols.

22. (previously presented) The transceiver according to claim 20, further comprising:

a timing signal generating unit for generating said timing signal synchronized with a periodical noise including said periodical noise duration which interferes with said transmitting data symbol;

a receiver equalizer; and

a sequencer for effecting a transition of the status of initialization of said transceiver during an initialization period before starting usual communication, said initialization period including an activation and acknowledgement sequence, a transceiver training sequence for performing an initial training of said receiver equalizer, a channel analysis sequence for measuring the quality of said communication line, and an exchange sequence for determining the transmitting capacity of said communication line based on the measured quality of said communication line.

23. (currently amended) The transceiver according to claim [[23]] 22, wherein, said sequencer effects the transition of the status based on the value counted by said hyperframe counter.

24. (previously presented) The transceiver according to claim 22, wherein, during said transceiver training sequence, said exchange sequence, and said channel analysis sequence, said initialization is carried out by transmitting DMT symbols through only the inside of said sliding window.

25. (previously presented) The transceiver according to claim 22, wherein, during said transceiver training sequence, said exchange sequence, and said channel analysis sequence except for a quality measuring sequence, said initialization is carried out by transmitting DMT symbols through only the inside of said sliding window, and during said quality measuring

sequence in said channel analysis sequence, said initialization is carried out by transmitting DMT symbols through both the inside and the outside of said sliding window.

26. (original) The transceiver according to claim 22, further comprising:

a sequence transition determining unit for making a transition, in synchronization with said timing signal, from said activation and acknowledge sequence to said transceiver training sequence or from said transceiver training sequence to said channel analysis sequence.

27. (previously presented) The transceiver according to claim 22, wherein, said DMT symbols are transmitted from said transmitting side through both the inside and the outside of said sliding window, and said DMT symbols are used for training of said receiver equalizer by said receiving side only when said receiving side is in a far end cross-talk duration.

28. (original) The transceiver according to claim 22, wherein, during the training of said receiver equalizer in said transceiver training sequence, a step size for updating coefficients of said receiver equalizer is made to be zero in said near end cross-talk duration, or to be a value smaller than the value in said far end cross-talk duration in said near end cross-talk duration at said receiving side, so that said transceiver training sequence is carried out continuously in said far end cross-talk duration and said near end cross-talk duration at said receiving side.

29. (previously presented) The transceiver according to claim 22, wherein said receiving side comprises:

a synchronization symbol detecting unit for detecting a synchronization symbol included in each of superframes which constitute said hyperframe;

an inverse synchronization symbol detecting unit for detecting an inverse synchronization symbol included in said hyperframe; and

an inverting unit for rotating the phase of each carrier signal of the detected inverse synchronization symbol, except for the carrier signal of a pilot tone, by substantially 180° to obtain an inverted inverse synchronization symbol having the same phase as the phase of each of the detected synchronization symbols;

the detected synchronization symbols and the inverted inverse synchronization symbol being used for the training of said receiver equalizer.

30. (original) The transceiver according to claim 22, wherein for watching or re-synchronizing the superframe or the hyperframe synchronization, in the case where the synchronization symbol is detected at the receiving side, the synchronization is checked with detection of the next inverse synchronization symbol, and in the case where the inverse synchronization symbol is detected, on the other hand, the synchronization is checked with the next detected synchronization symbol.

31. (currently amended) A transceiver to be connected through a communication line, wherein, during timing recover training sequence between central office and said remote terminal, an inside discrete multitone (DMT) symbol of a downstream sliding window is formed by a first kind of signal, and an outside DMT symbol of said downstream sliding window is formed by a second kind of signal, said first kind of signal and said second kind of signal being

obtained by modulating a carrier signal but being different in phase by a predetermined angle, and

said transceiver in said remote terminal recognizes whether a received DMT symbol belongs to a far end cross-talk duration at said remote terminal or a near end cross-talk duration at said remote terminal, by detecting the phase of the output of a fast Fourier transform of said carrier signal, so as to recognize the phase of a timing signal which represents a periodical noise duration.

32. (currently amended) A transceiver to be connected through a communication line, wherein, during timing recover training sequence between said central office and said remote terminal, an inside discrete multitone (DMT) symbol of a downstream sliding window is formed by a first kind of signal, and an outside DMT symbol of said downstream sliding window is formed by a second kind of signal, said first kind of signal and said second kind of signal being obtained by modulating a carrier signal but being different in phase by a predetermined angle, and

said transceiver in said remote terminal recognizes whether a received DMT symbol belongs to a far end cross-talk duration at said remote terminal or a near end cross-talk duration at said remote terminal, by detecting the phase of the output of a quadrature phase shift keying demodulation of said carrier signal, so as to recognize the phase of a timing signal which represents a periodical noise duration.

33. – 35. (canceled)

36. (currently amended) An ADSL modem for transmitting high speed data comprising:

a sliding window generating unit for generating a sliding window based on a TCM-ISDN timing signal; and

a sliding window transmitting unit for transmitting discrete multitone (DMT) symbols according to said sliding window;

said sliding window generating unit comprising:

a hyperframe counter for periodically counting a predetermined number of continuous transmitting DMT symbols constituting a hyperframe synchronized with said timing signal.

37. – 39. (canceled)